***Evaluation of exotic germplasm accessions of safflower***

1. ***Evaluation of accessions from Mexico***

Thirty accessions from Mexico were characterised and evaluated on alfisols, variability for quantitative traits has been presented.

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| **Characteristics** | **Mean±SEm** | **Range** |
| Days to 50% flowering | 79.07±0.81 | 72-90 |
| Plant height (cm)  | 80.60±1.43 | 55.7-91 |
| No. of branches/plant | 17.13±0.64 | 10-23 |
| No.of capitula /plant | 67.98±4.8 | 34-144 |
| Diameter of main capitula (cm) | 2.27±0.03 | 1.85-2.55 |
| 100-seed weight (g) | 4.11±0.11 | 2.45-5.5 |
| Hull content (%) | 36.99±0.69 | 28.6-44.2 |
| Oil content (%) | 35.37±0.62 | 27.2-41.7 |

Evaluation data for accessions with oil content >38% is given below.

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| **S. No.** | **Accession No** | **Alt Identity** | **Plant height upto tip (cm)** | **No of branches/plant** | **No of capitula/plant** | **Diameter of main capitula (cm)** | **No of seeds/main capitula** | **100-seed weight (g)** | **Hull Content (%)** | **Oil Content (%)** |
| 1 | EC-755660 | S-334 | 83.0 | 19 | 86 | 2.51 | 36 | 3.54 | - | 39.87 |
| 2 | EC-755666 | CC-1469 | 76.0 | 18 | 87 | 2.18 | 20 | 3.84 | 28.6 | 38.27 |
| 3 | EC-755671 | CCC-B4  | 91.0 | 19 | 78 | 2.3 | 24 | 3.94 | 39.8 | 39.88 |
| 4 | EC-755673 | Humaya-65  | 81.7 | 17 | 85 | 2.26 | 33 | 3.69 | 31.8 | 41.73 |
| 5 | EC-755675 | Aceitera | 78.3 | 12 | 60 | 2.53 | 28 | 3.42 | 34.6 | 41.69 |
| 6 | EC-755684 | S-719  | 76.7 | 18 | 49 | 2.18 | 33 | 4.2 | 37.6 | 38.21 |

1. ***Evaluation of USDA core set***

Preliminary evaluation and multiplication of the USDA core set of 206 accessions (one accession did not germinate) was undertaken.Selections (171) were also made on the basis of flower colour and spininess. Observations for nine agro morphological descriptors were recorded and accessions with unique morphological traits possessing more bracts (EC 739435) and no rosette period (EC 739358) and were identified through visual scoring.

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| **Characteristics** | **Mean±SEm** | **Range** |
| 100-seed weight (g) | 3.97±0.07 | 1.52-6.77 |
| Oil content (%) | 23±0.26 | 11.94-37.9 |

A set of 22 accessions were evaluated along with national check (A-1) during 2013-14. Two accessions (EC 739535 and EC 739537) recorded seed yield on par to the check and seven accessions with more number of capitula (>30) were identified. EC 739547, 739531 and 739541 (40-42%) were confirmed as high oil sources out of the seven accessions evaluated separately for oil content.

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| S. No. | GMU No. | Flower Colour at Bloom and Faded\* | Spininess of OIB\*\* | Plant Height [I] (cm) | Plant Height [II] (cm) | No. of Branches | No. of Capitula | Diameter of Main Cap. (cm) | No. of Seeds/ prim. Cap. | Seed yield/plant (g) | 100- seed wt (g) | Oil Content (%) |
| 1 | EC - 739358 | Y-OR | Sp | 104.2 | 122 | 12.2 | 27 | 2.08 | 31.8 | 15.99 | 4.97 | 25.75 |
| 2 | EC - 739362 | OR-RED | NSP | 110.2 | 117 | 8 | 15.6 | 2.22 | 24.6 | 5.633 | 4.07 | 21.87 |
| 3 | EC - 739363 | Y-OR | SSP | 101.2 | 123 | 7.6 | 21.2 | 1.8 | 10.4 | 14.15 | 4.37 | 22.77 |
| 4 | EC - 739372 | Y-OR | SSP | 85.8 | 99.4 | 7.4 | 16.4 | 2.2 | 50 | 13.11 | 3.64 | 21.53 |
| 5 | EC - 739384 | Y-OR | Sp | 102.6 | 113 | 6 | 15.8 | 1.96 | 17 | 4.059 | 3.59 | 21 |
| 6 | EC - 739393 | Y-RED | SSP | 112.4 | 138 | 9.6 | 34.6 | 2 | 3.4 | 9.194 | 5.19 | 23.58 |
| 7 | EC - 739418 | OR-RED | NSP | 94.2 | 125.2 | 6.6 | 19.2 | 2.36 | 10.2 | 12.07 | 5.81 | 21.15 |
| 8 | EC - 739435 | Y-OR | Sp | 85.6 | 96.6 | 9.2 | 18.8 | 1.92 | 31.4 | 5.336 | 4.87 | 25.54 |
| 9 | EC - 739441 | OR-RED | Sp | 86.4 | 100.6 | 10.6 | 25 | 1.68 | 17.4 | 11.6 | 4.29 | 24.22 |
| 10 | EC - 739454 | Y-Y | Sp | 87.6 | 100 | 6.8 | 16.8 | 2.05 | 14.4 | 10.49 | 4.62 | 21.81 |
| 11 | EC - 739465 | OR-RED | SSP | 116.6 | 140.8 | 5 | 15.8 | 2.84 | 36.2 | 7.878 | 4.6 | 21.02 |
| 12 | EC - 739466 | OR-RED | SSP | 140.2 | 160.8 | 7.4 | 26.8 | 1.98 | 16.2 | 10.52 | 4.76 | 22.5 |
| 13 | EC - 739469 | OR-RED | NSP | 114.2 | 136.4 | 9.8 | 19 | 2.12 | 26 | 3.333 | 2.83 | 27.13 |
| 14 | EC - 739476 | Y-OR | Sp | 82 | 99.8 | 11.2 | 32.2 | 2 | 21.6 | 13.73 | 4.53 | 26.2 |
| 15 | EC - 739480 | Y-OR | Sp | 71.4 | 84 | 12.8 | 31.4 | 1.7 | 17 | 11.24 | 3.87 | 25.13 |
| 16 | EC - 739481 | W-W | Sp | 66.8 | 73.2 | 10.4 | 27.4 | 1.98 | 15.2 | 7.203 | 5.19 | 25.48 |
| 17 | EC - 739501 | Y-OR | SSP | 102.8 | 132.4 | 9.6 | 32.6 | 1.82 |  | 11.95 | 5.5 | 21.69 |
| 18 | EC - 739509 | Y-GY | Sp | 143 | 156.8 | 10.8 | 33.6 | 2.2 | 9.8 | 11.11 | 5.7 | 24.41 |
| 19 | EC - 739518 | OR-RED | Sp | 75.2 | 86.2 | 8.2 | 19 | 2.08 | 16.6 | 8.437 | 4.14 | 22.82 |
| 20 | EC - 739535 | Y-Y | More Sp | 88 | 102 | 9.6 | 30 | 2.08 | 23.2 | 18.77 | 3.28 | 30.64 |
| 21 | EC - 739537 | Y-OR | SSP | 99.6 | 121.8 | 11.4 | 39.2 | 1.76 | 21.8 | 22.79 | 3.53 | 25.54 |
| 22 | EC - 739544 | OR-RED | SSP | 115.2 | 143.8 | 8 | 37.6 | 2.12 | 23.4 | 12.9 | 3.47 | 25.54 |
| 23 | A -1(check) | Y-OR | Spiny | 81.2 | 89.4 | 12.4 | 42.6 | 1.78 | 7.2 | 19.83 | 6.22 | 23.92 |

\*Y-yellow, OR-orange, GY-golden yellow, W-white \*\*SP-spiny, NSP-non-spiny, SSP-sparsely spiny

1. ***Trait specific USDA accessions***

Of the 40 accessions and their selections, variability for traits recorded in accessions with oil content >35.6% is presented.

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| **GMU No.** | **Plant Height (cm)** | **No. of Branches** | **No. of Capitula** | **Diameter of main capitula (cm)** | **No. of Seeds /prim. capitula** | **Seed yield/plant (g)** | **100 -seed weight (g)** | **Oil Content (%)** |
| EC - 736487 | 80 | 12 | 25 | 2.38 | 51.2 | 13.9 | 2.44 | 36.62 |
| EC - 736489 | 75.6 | 12 | 23 | 1.94 | 17 | 8.5 | 3.2 | 38.96 |
| EC - 736498 | 88 | 11 | 19 | 1.98 | 5.8 | 14.2 | 4.19 | 38.62 |
| EC - 736501 | 79.8 | 11 | 25 | 2.1 | 22.4 | 10.4 | 3.54 | 37.1 |
| EC - 736503 | 92.2 | 11 | 26. | 2.74 | 41 | 14.2 | 3.71 | 38.26 |
| EC - 736506 | 84 | 12 | 24 | 2.24 | 29.6 | 6.7 | 2.65 | 37.18 |
| EC - 736516 | 89.8 | 12 | 22 | 2.16 | 28.6 | 11.3 | 2.84 | 35.78 |
| EC - 736517 | 88.8 | 16 | 32 | 2.04 | 29.2 | 14.7 | 3.1 | 39.08 |
| EC - 736517- 1 | 82 | 14 | 43 | 2 | 28 | 20.0 | 3.23 | 40.2 |
| EC - 736520 | 93 | 12 | 27 | 2.12 | 36.6 | 27.7 | 3.4 | 35.59 |